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IS 9203-1 (1979): Friction Rollers for Mine Haulage Tracks, Part I: Technical Supply Condition [MED 8: Mining Techniques and Equipment]

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(Reaffirmed 1999)

Indian Standard

SPECIFICATION FOR FRICTION ROLLERS FOR MINE HAULAGE TRACKS

PART I TECHNICAL SUPPLY CONDITIONS

1. Scope — Covers the general requirements for various types of rollers and pulleys used on the mine haulage tracks for guiding the haulage rope.

2. Terminology

2.1 *Barrel* — That part of the roller on which the rope runs and includes the flanges or end caps.

2.2 *Bearing* (*Plain*) — A bearing with wholly sliding surfaces, that is, without any balls or rollers.

2.3 *Bearing* (*Rolling*) — A bearing of the ball, roller or the taper roller type.

2.4 *Body* — The barrel or part of the roller on which the liner is supported including the end flanges.

2.5 *Liner* — The non-metallic part of assembly on which the rope runs.

2.6 *Double Sealed* — Sealed for life, to resist loss of grease and ingress of dirt.

2.7 *Pulley* — A drum having a curve or ballot shape profile.

2.8 *Roller* — A flanged drum which is free to rotate, to support or guide a moving rope, having a parallel or taper sided barrel, the diameter being not greater than the length of the barrel outside the flanges.

2.9 *Roller Assembly* — The roller unit, consisting of the barrel and spindle, and bearing where applicable.

2.10 *Spindle* — The shaft on which the barrel is mounted.

2.11 *Throw* (*Eccentricity*) — The total variation from true running of the periphery of the barrel when mounted on the spindle.

3. Material — As specified in Table 1.

TABLE 1 MATERIAL FOR COMPONENTS OF FRICTION ROLLERS

Component	Material Conforming to	
	Castings	Fabrication
Barrel	IS : 210-1970 'Grey iron castings' or IS : 1030-1974 'Carbon steel castings for general engineering purpose (*second revision*)' or IS : 276-1969 'Austenitic manganese steel castings (*second revision*)' or IS : 4296-1968 'One percent chromium steel castings for resistance to abrasion'	Steel tubes with 0·35% carbon and having a hardness of 320 *HV* (≈ 300 *HB*), *Min.* Roller ends shall be cast from material specified under castings or from material conforming to IS : 2107-1962 'Whiteheart malleable iron castings'
Spindle	C20 or 40S18 of IS : 1570-1961 'Schedules for wrought steels for general engineering purposes' or IS : 226-1974 'Structural steel (standard quality) (*fourth revision*)'	
Plain bearings	IS : 210-1970 'Grey iron castings (*second revision*)'	
Liner	Rubber, plastic and non-metallic material resistant to abrasion, oil and flame	

Mining Sectional Committee, EDC 50; Mine Tracks Subcommittee, EDC 50 : 12 [Ref : Doc : EDC 50(2881)]

Adopted 7 June 1979 | © January 1980, ISI | P[redacted] Gr 2

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3.1 Aluminium, magnesium or their alloys shall not be used for any component other than as a final deoxidant in the melting process of the material.

4. Eccentricity

4.1 *Barrel* — The roller assembly shall be supported in V-blocks, A-A, placed at points approximating to the position of the pedestals as shown in Fig. 1. When the assembly is rotated through one revolution, the distance between barrel and the fixed points, B-B, shall not vary by more than the amount specified below:

Type of Roller	Eccentricity	
	Up to and Including 150 mm Dia	Over 150 mm Dia
a) Cast roller having pressed-in spindle	Throw 1·6 mm	Throw 2·4 mm
b) Cast roller having cast-in spindle	Throw 3·2 mm	Throw 4·8 mm
c) Fabricated roller with fixed spindle	Throw 1·6 mm	Throw 2·4 mm
d) Any roller bearing	Throw 1·6 mm	Throw 2·4 mm

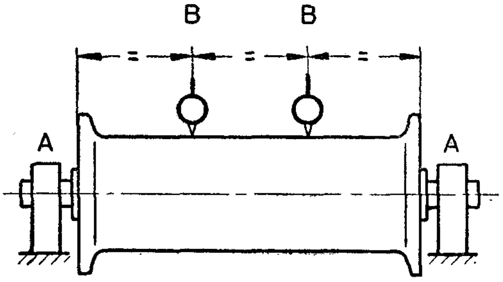

FIG. 1 ARRANGEMENT FOR ECCENTRICITY TEST

4.2 At other places the eccentricity shall not exceed 3·2 mm for barrels of diameters below 150 mm and 4·8 mm for diameters above 150 mm respectively.

5. General Requirements

5.1 All castings shall be properly fettled and dressed and all surfaces shall be satisfactorily cleaned for inspection purposes.

5.2 All components of the assembly shall be free from harmful defects.

5.3 Minor defects which shall not affect the mechanical strength or the performance of any roller, may be rectified by welding.

5.4 Rolling bearings when used shall conform to the relevant Indian Standard and shall be double sealed, grease filled, rigid, single row ball bearings.

5.4.1 Bearing covers when used shall not project more than 6 mm from the flange faces.

6. Hardness — The barrel of the rollers shall have a minimum hardness of 210 *HV* (200 *HB*) when cast and 320 *HV* (300 *HB*) when fabricated but shall not exceed the hardness of the rope with which these rollers are required to be used.

7. Heat Treatment — The roller shall be suitably heat-treated to achieve the required mechanical properties.

8. Marking — Each roller shall be marked legibly on the flange with the following information:

a) Manufacturer's name or identification mark; and

b) When cast, an indication of the material used.

Note — Letters S, SA, I, IA shall be used to indicate cast steel, cast alloy steel, cast iron and alloy cast iron respectively.

8.1 *ISI Certification Marking* — Details available with the Indian Standards Institution.

9. Tests — If agreed between the purchaser and the manufacturer, mechanical tests may be conducted in addition to the eccentricity test specified in **4**. For this purpose, the test pieces shall be cast separately from, but where applicable be heat-treated with, the castings they represent.

EXPLANATORY NOTE

This standard on friction rollers is being issued in different parts as follows:

Part I Technical supply conditions

Part II Parallel rollers

Part III Tapered and vertical rollers and horizontal and vertical pulleys

Part IV Rollers with non-metallic rope bearing surfaces

In the formulation of this standard considerable assistance has been derived from the following publications, issued by the British Standards Institution:

BS 3876 Specification for rope rollers and mountings for Colliery track haulage:

Part I : 1965 Parallel rollers

Part II : 1965 Tapered and vertical rollers; also vertical and horizontal pulleys

Part III : 1965 Rollers with non-metallic rope bearing surfaces

Printed at Delhi Printers, Delhi, India